

Nov 75



data channels

THE NEWSLETTER OF THE DATA COMMUNICATIONS INDUSTRY
published by DATAMATION magazine

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James M. Morris
Publisher

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volume 2 number 10

october, 1975

ON THE INSIDE

Tutorial:

How to get the most value at the least cost from WATS as a result of tariff changes approved by the FCC during the past several months (page 4).

New Products/Services:

AT&T introduces a new credit authorization terminal, and a synchronous Dataspeed 40 (page 7); Western Union unveils a cheap crt and Interdata announces a bit-oriented, multi-protocol, synchronous interface (page 6); Datan offers two new services (page 3).

Federal Systems:

An exclusive interview with Ted Puckorius, GSA's new adp procurement chief, reveals a number of upcoming changes in federal policies and procedures (page 1).

Networks:

Differences between proposed U.S. and international link control standards appear to be largely resolved after an ISO meeting in Washington this month; as a result, the final version of the U.S. standard may be OK'd by ANSI's X3S34 working group in December (page 3).

Etcetera:

Aetna Insurance Company will be the third partner in CML Satellite Corporation; Congress kills Agriculture's national telecom plan; FCC hearing examiner approves significant boost in AT&T's rate of return (page 3).

GSA plans big shifts in ADP procurement

A much-debated, much-delayed consolidated procurement of commercial teleprocessing services for the federal government should be on the street by Nov. 15th, says Ted Puckorius, commissioner of GSA's Automated Data and Telecommunications Service (ADTS). The winning bidders will share a pot estimated to be worth \$50-60 million the first year the contract is in force, and considerably more after that.

Puckorius, whose office is developing the rfp, was interviewed this month; he reported that the final version of the document will not require discount benchmarks. This should gladden the many prospective bidders who have been screaming about this provision (DATA CHANNELS, Aug. '75, page 3). The rfp will also be changed in several other respects, he said. For example, "more reasonable" language concerning liquidated damages has been drafted.

A knowledgeable non-GSA source reported the effect of the rewritten liquidated damages clause will be to reduce the vendor's costs if he fails to meet specified performance requirements — for example, if he guarantees his network will be up 96% of the time required, and it's only available 95% of the time, he will be forced to reduce his service charge 1% for the period involved; the penalty was 5% in earlier drafts of the rfp. This source added that he will be "surprised" to see the rfp out by Nov. 15th; the end of this year is "more reasonable."

Puckorius made it clear that bidders for the upcoming contract will have to offer greater-than-commercial discounts if they want to win. "We're bigger than any private customer and therefore we're entitled to a bigger consideration," he explained. It hasn't been decided, however, whether specific language will be inserted in the bid solicitation making such discounts mandatory.

The ADTS commissioner revealed a number of upcoming changes in federal adp procurement policies and practices during the interview. Here are the highlights:

- Despite intense opposition from using agencies, and some pressure from Capitol Hill, GSA is four-square in favor of contracting out a substantially greater percentage of the federal adp workload — so much so that at a recent get-together of GSA officials and federal vendors, sponsored by the Computer and Business Equipment Manufacturers

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Association (CBEMA), Puckorius asked industry support in winning the blessing of Congress for this idea.

Before a substantially increased volume of outside contracts can be advertised, however, an amendment to Federal Policy Circular A-76 must be adopted (see "Related News" below). But Puckorius said "the next time an agency asks us for authority to procure a small- or medium-scale system, we will insist that they solicit bids from outside services firms. We and OMB (Office of Management and Budget) don't want to reduce the agencies' present in-house capability; rather, we want to prevent its further expansion."

• GSA intends to seek a change, during the next few months, in a provision of the Brooks Bill that makes each using agency the sole judge of its own system requirements. Instead, the user would submit performance requirements, and these would then be analyzed and validated by GSA before the bid invitation was issued. A major purpose of this change is to reduce the number of system procurements — particularly those negotiated on a sole source basis — and increase the number of services procurements as well as the utilization of surplus and shared systems already in the federal inventory.

• Another legislative goal is to fully capitalize the adp revolving fund established by the Brooks bill (see "Related News" below). But Puckorius emphasized that he doesn't want GSA to take over all federal procurements. He *does* want his office to have the authority to determine how much procurement it will handle directly. Asked to elaborate, he said GSA should acquire systems "for those agencies we haven't certified as being qualified, and — on a selective basis — for those agencies we have certified." The latter authority is needed, he explained, to audit the performance of agencies which receive delegations of procurement authority (DPAs) from GSA, and to maintain GSA's own procurement administration capabilities.

Related News:

• Another big procurement battle seems to be starting on Capitol Hill. This one pits the Office of Management and Budget (OMB) against federal adp users, and smaller systems manufacturers against suppliers of dp services. Included in this latter group are the big mainframers, like CDC, that also offer service bureau and related support.

The source of the conflict is a proposed federal policy circular, technically an amendment to existing Circular A-76, designed to give users "guidance" in procuring adp capability. The critics are unhappy because the proposed circular strongly favors hiring outside service suppliers instead of acquiring in-house systems.

An agency needing a new system would have to contract with an outside services firm unless doing the work in-house was 15-25% cheaper. Furthermore, there would have to be "a sound basis for presuming" such a cost differential existed before the agency could undertake a cost analysis. In all other cases, using an outside supplier would be presumed to be the better approach. Another part of the circular says that "under no circumstances" can an agency desiring to procure in-house dp facilities base its justification on work being done for other agencies.

Federal dp users are unhappy with the proposed policy because it threatens to stifle future growth of their in-house operations. Congressional sources say the proposal would prevent agencies from obtaining dp capability at minimum cost, and thus frustrate a major goal of the Brooks bill. The staff of the House Government Operations Committee, whose chairman, Jack Brooks (Texas), authored the bill, is known to be reviewing the current draft of the OMB circular.

William Russell, a deputy administrator of OMB's Office of Federal Procurement Policy (OFPP), which drafted the document, reported this month that several criticisms have been received from agencies. Revised language is now being drafted.

"The basic thrust of the present proposal probably will be retained," he said, "but we expect make the implementation procedures less detailed." □

• Federal adp costs could be cut drastically if the General Services Administration (GSA) were allowed to acquire most systems and services on behalf of the agencies, using a revolving fund established several years ago. This hasn't been done mainly because the Office of Management and Budget (OMB) doesn't believe the Brooks Bill requires it. The history of the legislation, however, "clearly shows" that its drafters considered adoption of such procedures "essential."

So said the General Accounting Office (GAO) early this month in a report to Congress. GAO added that out of some \$3.2 billion worth of dpe procured by the feds during FY 1970-72, only about 1%, valued at \$23 million, was procured with revolving fund money. Yet, "GSA has estimated that because of these purchases, the government will save about \$26 million." GAO neglected to estimate what the government would save if all of its adp systems were acquired with revolving fund money, but the implication was that total expenditures could be reduced at least 50%.

As a "single purchaser," the report points out, GSA would be the owner/lessor of systems acquired by the feds, rather than the using agencies. This would allow a greater amount of equipment reutilization—a system could be transferred to another agency, for example, once the first user no longer needed it. Although such transfers are now being made, the program is limited because the initial decision to purchase or lease a system, as well as the term of the lease, is determined almost entirely by the first user's requirements.

If GSA were the purchaser/lessor, said GAO, costs would be cut because more systems could be purchased instead of being leased, and leases could be negotiated for longer terms. Also, individual agency requirements more often could be consolidated, enabling the government to reap bigger savings from bulk discounts.

The report recommends that Congress direct OMB and GSA to prepare a plan for fully capitalizing the revolving fund and enabling the latter agency to act as a single purchaser. GAO pointed out that the fund, even as presently capitalized, isn't being fully utilized because of OMB-imposed limitations. For FY '75, only \$6 million could be spent, even though, at the beginning of that year, there was an unobligated balance of \$37 million.

Tymshare really common carrier, charges Telenet in FCC complaint

Tymshare's joint user network service is really a common carrier offering and should be regulated as such, said Telenet Corporation in a complaint filed with the FCC last month. Tymshare is scheduled to reply by the end of this month. The case is significant because the Commission has been considering the extent to which on-line service bureaus and other customers of the carriers should be allowed to resell or share circuits. A second question being addressed in this proceeding (Docket 20097) is "the extent to which entities proposing to resell services or arrange line sharing should be regulated by this Commission." A decision is considered likely before the end of the year.

Currently, resale and sharing are regulated directly by carrier tariffs, and indirectly by the FCC's 1970 Computer/Communications Decision. Tymshare's basic point is that it's complying with the tariff regulations, and therefore is not providing a common carrier service. Telenet insists that Tymshare's network is a largely-communications rather than a largely-data processing service which, under the 1970 decision, can be provided only by regulated communication carriers.

Datran unveils new bulk rate, overseas services

Datran asked the FCC this month for permission to launch an overseas datacom service in collaboration with RCA Globcom. The new offering was first reported in DATA CHANNELS last month (page 7). It consists essentially of Datran-supplied digital facilities between the user's site and RCA's terminal in New York, and RCA-supplied analog facilities the rest of the way.

The Datran link can be either a full-period private line or an occasional-use, switched "Datadial" circuit. In the latter case, the Datran link must be manually patched to the RCA circuit; a tariff covering a direct Datadial connection reportedly is being developed.

If not disapproved by the Commission, the new service will begin the first of next month for customers in the 18 metropolitan areas now serviced by the Datran network; 12 more cities are to be added by the middle of next year.

Datran also requested Commission approval of a new bulk rate offering that reportedly will save eligible customers 10-20%. This one likewise carries a Nov. 1st effective date. It applies to channels rated at 2.4, 4.8, and 9.6 kbs. The customer must contract for a minimum of 78,400 kilobit channel miles of circuitry per month (the kilobit mileage of a channel equals its transmission speed multiplied by its airline mileage). Also, service must begin within six months after the contract is signed. Sharing is prohibited except for "composite data service vendors," federal agencies, and certain government-regulated entities like stock exchanges.

Unlike Telpak, which is the closest competitive offering, the channels leased under Datran's proposed new bulk rate offering would not have to parallel each other. ☐

- The Justice Department may be getting ready to let the states support criminal justice information systems on non-dedicated computers. Three public hearings will be held on the question, beginning next month in Washington, D.C. (Atlanta and San Francisco are the other two sites). Afterward, the department will decide whether to amend a set of privacy guidelines which the states must comply with, beginning the end of this year, to receive grants from the Law Enforcement Assistance Administration (LEAA). Although they're allowed extra time, under these guidelines, to install dedicated systems, the states are still unhappy; they argue, basically, that dedication is unnecessary and a waste of scarce dollars. Through groups like the Council of Governors, they've complained not only to the Justice Department but also to the White House.

- When Congress objected to the Agriculture Department's original plan for a nationwide telecom network (DATA CHANNELS, July '75, page 6), the agency scaled it down considerably; but early this month, a Senate-House conference committee rejected the revise. Univac, Burroughs, and Honeywell, which bid the original system, reportedly put \$1 million apiece into their proposals. Specifically, the conference committee ordered Agriculture not to "take any action with respect to computer procurements without first obtaining the approval of both the House and Senate appropriations committees." For good measure, the conference committee sharply curtailed the department's working capital fund, which would have financed the acquisition. An inside source says the cut reduces the fund below even its present level; this may force curtailment of operations at Agriculture's five existing dp centers.

- Just before presstime, the Agriculture Department procurement was officially cancelled. A GSA source said he expects the department will now try to negotiate a sole-source

acquisition, probably with IBM. GSA would have to approve such a move, however. He declined to speculate on whether it would.

ISO link protocol progresses; U.S. proposal nears penultimate vote

Agreement on a standardized link control protocol for packet- and circuit-switched public networks appears to be significantly nearer after an International Standards Organization (ISO) meeting in Washington, D.C. this month.

The gathering was convened by ISO's subcommittee 6 (SC6); it approved new language concerning error recovery procedures, and discussed other changes which now will be submitted to a letter ballot of the subcommittee membership. If the changes are approved, as appears likely, ISO's proposed "high-level data link control" (HDLC) will be quite similar to "advanced data communications control protocol," (ADCCP), a pending U.S. standard.

The American National Standards Institute (ANSI) task group that developed ADCCP has been marking time in recent months waiting for ISO to catch up. Now that the two drafts appear to be in harmony, the task group (X3S34) may decide to finally OK ADCCP and send it to X3S3, the next node in the processing chain, X3S34 meets next December in Anaheim, Cal.

HDLC and ADCCP each consist essentially of three parts: a frame structure specification, which assigns fields within the transmission header; "elements of procedure," consisting mainly of commands and responses; and "classes of system" — rules for using the commands and responses on specified types of links.

Last August, ISO reached final agreement on the frame structure. Its version is identical to the one adopted by X3S34 for ADCCP.

At this month's meeting in Washington, SC6 amended HDLC's elements of procedure to include a new error recovery scheme, and also agreed to vote — by letter ballot — on several additional commands and responses. All of these changes are already embodied in the U.S. proposal.

The ISO subcommittee also decided to conduct a vote on five "classes of system." The U.S. proposal contains four of them, plus some others, but X3S34 Chairman David Carlson, of Bell Telephone Labs, indicated that resolving these differences shouldn't be difficult. ☐

- The third partner in CML Satellite Corporation will be a subsidiary of Aetna Insurance Company — the nation's largest diversified financial concern, with assets of \$14.8 billion. The traffic generated by Aetna and one of the other partners — IBM — may enable CML to break even from the moment it begins operation.

The FCC must accept the new consortium but has already indicated that it will do so if CML is owned by three partners each having a one-third interest (DATA CHANNELS, Feb. '75, page 5). Essentially, this is the scheme Comsat General, IBM, and Aetna proposed to the FCC last month. The Commission won't act officially until a formal system plan is submitted. The plan is now being drafted.

- AT&T's overall rate of return should be increased to 10%, recommended FCC Administrative Law Judge Byron E. Harrison this month. If his verdict is accepted by the Commission, it probably will mean another rate increase on top of the \$365 million hike the phone company received last March (DATA CHANNELS, Mar. '75, page 1; Aug. '75, page 2). That one was based on an 8.74% overall return. But several groups, including the FCC's separated trial staff, say Harrison's figure is too high and they're certain to argue that the Commission should set a lower one.

WATS: HOW TO GET THE MOST FOR THE LEAST

The economic justification for using wide area telephone services (WATS) has changed significantly during the past several months as a result of two tariff changes—one effective in March '74, the other in March '75:

- "Full Period" WATS, which provided unlimited use, was replaced by Full Business Day (FBD) Service, which allows you to make up to 240 hours of calls per month for a flat rate. (AT&T calls this the "initial period rate.") The overtime charge for FBD service is approximately 66% of the equivalent hourly initial period rate. However, there's a further limitation...

The new rates are based on an average call holding time (AHT) of one minute. Thus, the FBD initial period charge allows you to make no more than 14,400 calls (240 hours x 60 minutes). If you exceed this limit, you pay an overtime charge even if the total time consumed is 240 hours or less. Likewise, customers who buy Measured Time WATS—10 hours of calls for a flat rate—are allowed a maximum of 600 calls, after which they are charged extra.

In the case of both FBD and measured time services, you can make up to 60 calls for each hour of overtime billed.

- Rates for shorter-distance WATS calls were increased, while those for longer-distance calls were decreased (see Table 1 for detailed comparison).

- WATS band 6 was combined with band 5. The result: previous band 5 users are now able to communicate with a bigger geographic area, while former band 6 users pay significantly lower rates.

- One-time installation and move charges were increased. For example, suspension of service, which cost \$15 in January '74, now costs \$52.55, the service installation charge is also \$52.55, versus \$10 at the beginning of '74.

- Each Inward WATS line group must be linked to the telephone company's central office by a minimum of two access lines, to reduce network congestion. No extra charge is imposed directly for the second circuit, however your switchboard trunk termination charges may go up. But most users have found that the second line improves their Inward Wats Service. The monthly service charge is based on the total number of calls that come in over both lines.

MTS Changes

Meanwhile, the Message Telecommunications Service (MTS) tariff—more familiarly known as long-distance dial-up—has been significantly restructured. There are two key changes: the initial period minimum for a day-rate, station-to-station call was reduced from three minutes to one minute; shorthaul (under 600 miles) MTS rates increased, while charges for calls over 700 miles decreased.

The economic tradeoffs between WATS, MTS, and private line services have been drastically altered as a result of these changes. Many subscribers now using one of the three services will find that by switching to another they can reduce costs significantly. Changing internal calling patterns may provide a similar benefit. Here are some general guidelines to keep in mind as you study the options:

The higher rates for Measured Time Service in bands 1 and 2 (see Table 1) suggest that WATS applications within these areas which were formerly marginal or borderline may now be uneconomical. Similarly, for WATS subscribers with higher traffic volumes—those who formerly used Full Period Service and are now paying FBD rates—it may be possible to avoid at least some of the increase by switching to Measured Time Service.

Long-distance dial-up rates have changed much more than WATS charges. For example, a two-minute, day-rate, station-to-station MTS call, New York City to Los Angeles, is down by 25%; the comparable WATS reduction is 8-10%. A three-minute call between New York City and Philadelphia via MTS is up 60%, double the increase in band 1 WATS.

Under the old tariffs, it was often cheaper to use WATS for short calls because they were billed on the basis of six-second increments—i.e. 0.1 minutes. The minimum MTS charge, by comparison, was based on a three-minute call. Now that the initial billing period for MTS has been reduced to one minute, this feature of WATS is less valuable, particularly since the latter tariff imposes a surcharge if your calls average less than a minute apiece.

But the six-second WATS billing increment may still offer an advantage. For example, if a call lasts five minutes 10 seconds, the WATS user pays for 5.2 minutes, while the MTS user pays for six minutes.

(continued on next page)

WATS Band	FBD Service	Measured Time Service
1		
Base Rate	\$364.00	\$27.85
Over-time	3.13	2.33
2		
Base Rate	377.00	15.13
Over-time	3.93	1.20
3		
Base Rate	259.00	(4.15)
Over-time	4.34	(.25)
4		
Base Rate	99.85	(25.80)
Over-time	4.51	(1.95)
5		
Base Rate	(7.55)	(39.80)
Over-time	4.64	(2.97)
6		
Base Rate	(172.80)	(68.88)
Over-time	4.64	(4.58)

TABLE 1: Shown above are the average increases (decreases) in WATS rates since Jan. 1 '74, by band and type of service.

There is little difference between the per-minute rates for Measured Time WATS and the related average charges for station-to-station long-distance dial-up service within the same geographic service area (WATS band). WATS may nevertheless be far more economical if:

- a majority of your calls are close to the outside perimeter of the band, where station-to-station toll rates are high in relation to per-minute WATS charges.

- using WATS would enable you to reduce or eliminate person-to-person, collect, and public pay phone calls, all of which are billed on the basis of "operator-assisted" rates, which are considerably higher than station-to-station toll charges.

- you need considerably more than 10 hours per month of Measured Time Service. In this case, your average per-minute cost will drop well below the comparable station-to-station toll rate.

WATS Disadvantages

WATS is not an unmixed blessing, though. One drawback is that call accountability is difficult to manage, unless each call is logged by a switchboard operator and charged to a specific employee or department - an arrangement that probably will increase your costs and add to overall calling time. One way of reducing this problem is to randomly mix WATS access lines with MTS lines (without telling your employees), so that about 10% of all long-distance calls are handled by the latter service. The switchboard operator then logs each MTS call by extension number, time, and trunk, and this information - when combined with the phone company's monthly statement - provides an analog of WATS usage which can be used to allocate costs of that service, and can also uncover departments or individuals making an excessive number of WATS calls.

The WATS tariff permits you to contract for service to a particular geographic band and communicate with intervening (lower-numbered) bands at the same rates. This feature can reduce the monthly telephone bill if you're now using MTS to communicate with the latter area. Here's an example:

A New York City WATS user currently has a band 5 Measured Time Service. His average use is 18 hours/month, and he pays \$407.80/month for that service. He uses MTS to call band 4, and pays \$250/month for that service. The average holding time on band 4 calls is 6 minutes, and the average cost of each call is \$2.60. By switching this traffic to WATS, he pays an additional \$191/month in WATS charges (for 10 hours of band 5 overtime), but saves the \$250/month MTS charge.

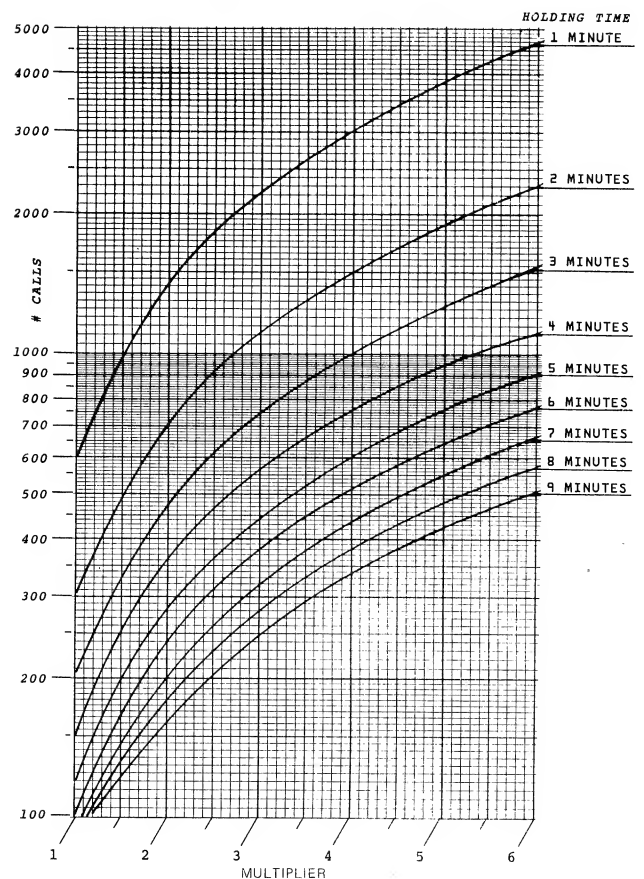
Combining Measured Time WATS services to adjacent or nearby bands into a single FBD service to the higher band is another possible way of reducing the bill, as shown in the following example:

A WATS user in New York City had a band 3 and band 5 Measured Time Service. His average use was 45 hours/line, and his monthly cost, including overtime, averaged \$1935. Under the new WATS tariff, his costs decrease to \$1769.75. But by combining both Measured Time services into a single band 5 FBD service, he pays only \$1675. In addition, FBD gives him an additional 10,200 minutes of calling time at no extra expense. (Admittedly, his employees may quickly soak up this additional time, and then some, if usage is not controlled, so it may be necessary to plow back some of the saving into an improved call-accounting system.)

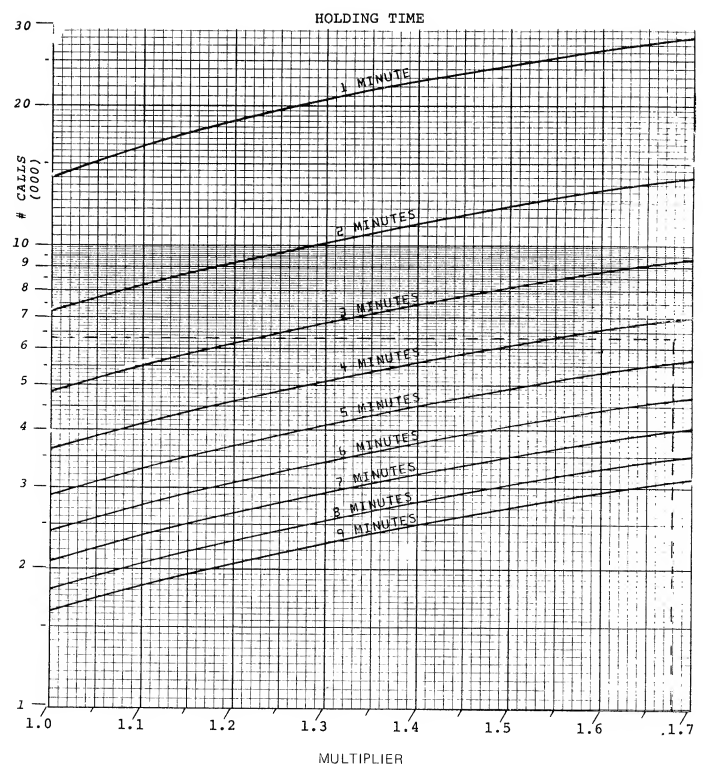
Lowering Datacom Costs

Data terminal polling, credit authorization, and dispatching are among the applications where the average holding time per call is generally less than one minute, and where, as a result, the user who chooses WATS pays a premium. One way around

MEASURED TIME RATE CALCULATOR



FULL BUSINESS DAY RATE CALCULATOR



(continued on next page)

this problem is to add administrative traffic to such an application. Since administrative calls tend to be longer, they will raise average call holding time.

Another approach, for operators of polled data networks, is to eliminate the verbal communication needed to find out if a distant terminal is ready to transmit or receive a message; a high percentage of these calls are typically of very short duration. A given WATS line can be dedicated to communication with remote data terminals, then engineered so that if a given number of rings at the far end does not produce an answer, the connection is automatically terminated.

Accompanying this article are two nomographs which should help you determine your WATS costs. One is designed for FBD, the other for Measured Time Service estimates. In either case, you must first determine the average holding time of your message traffic to each WATS band, and the average number of calls per line (or total number for a single line).

Given these two factors, find the horizontal axis corresponding to the "number of calls" and follow it across until it intersects the appropriate "holding time" curve. Extrapolate between the curves if necessary. The "multiplier" (scale reading across the bottom of the nomograph) can be determined by following the vertical access from the point of intersection.

To further explain this procedure, we've drawn dashed lines on the FBD nomograph showing the calculation for a user who has 6,300 calls/month and an average holding time of 4.5 minutes/call. Note that the multiplier is 1.68. Multiplying this

CRT terminal costing no more than teletypewriter introduced by WU

A low-cost crt terminal costing no more than a Class 33 teletypewriter for a basic application was unveiled by Western Union Data Services this month.

The Video 100 has a 24-line, 1920-character screen; 64-character display; and a 59-key, typewriter-like keyboard. Each character is generated by a 5x7 dot matrix. The new terminal operates half- or full-duplex, asynchronously, at 75-19,200 bps., and can be acoustically coupled or hard-wired to a transmission channel. It can be connected to a teleprinter if hard-copy printout is desired and/or to a mag tape cassette if additional I/O storage is needed. Major applications, said Western Union, include on-line program debugging and the transmission of short queries and responses between a remote location and a computerized data base.

The new terminal is a customized version of the Lear-Siegler ADM-3. Western Union offers the basic model for \$65/month on a one-year basis, and \$75/month on a 90-day basis. This version has originate-only capability, displays 64 upper-case characters (but transmits the full 128-character upper/lower case ASCII set), and doesn't include a modem or acoustic coupler.

The next step up is a Video 100 with acoustic coupler and built-in type 103 modem, which can operate at speeds up to 300 baud. It costs \$75/month if ordered for a year, and \$90/month on a 90-day basis. (A DAA-type modem to interface the Video 100 with Bell's dial-up network, will also be offered by Western Union, but the price hasn't been announced). Originate-answer capability costs \$80 or \$95/month, and lower-case display adds another \$3 to these prices. ("Originate-answer" capability, essentially, permits messages to be transmitted directly between the Video 100 and another terminal and vice versa. An "originate-only" terminal, by comparison normally communicates in both directions only with a computer or a local controller).

First deliveries of the Video 100 are scheduled for next January. For additional information, phone Western Union Data Services toll-free at 800-631-7050; in New Jersey, phone 201-529-1170. ☐

factor by the initial period rate (for a single line or for all lines in a WATS group) will show the total WATS charge/month, less federal excise taxes.

If your "number of calls" line fails to intersect the proper curve representing holding time on the upper portion of the scale, either you've made an error or your system is saturated. If this happens on the lower portion, overtime charges are not applicable — i.e. your total cost will be the applicable initial period rate.

If you can't relate number of calls and holding time on the upper portion of the "measured time" nomograph, your usage is so great that FBD service is really called for; if this happens on the lower portion, your usage is so low that Long-Distance Dial-Up probably would be more economical. ☐

(This tutorial is based on a report entitled "WATS: From the User's Perspective," published by the Center for Communications Management, Inc., P.O. Box 324, Ramsey, N.J., 07446. The full text can be obtained from CCMI. Price: \$40.00.)

New Interdata interface supports 4 link protocols concurrently

An interface that permits Interdata computers to communicate directly with terminals using bit-oriented link protocols was unveiled last month. Burroughs recently announced a somewhat similar product (DATA CHANNELS, July '75, page 3), and DEC reportedly is working on one (DATA CHANNELS, Aug. '75, page 1).

Interdata's Quad Synchronous Adapter (QSA) reportedly supports IBM's SDLC; HDLC, a proposed international protocol standard; and ADCCP, a proposed U. S. version. It also allows Interdata computers to talk to terminals which operate on binary synchronous code (BSC), IBM's widely-used character-oriented protocol.

QSA consists physically of a single printed circuit board. It's priced at \$2,600 in the above version. A BSC-only model costs \$1,600; the latter can be upgraded "easily" to the former, says Interdata. Both will be available in the fourth quarter of this year.

On the network side, QSA connects to four synchronous lines, and on the computer side it attaches directly to either the mainframe multiplexor bus or a selector channel that accesses main memory. Under program control, QSA allows the computer to communicate concurrently with terminals using any or all of the four protocols. But to provide end-to-end communication, on-line, between a remote terminal user and a data base or application program inside the central processor, requires ITAM (Interdata's Telecommunications Access Method), a recently-announced software system. ITAM costs \$2,500. ☐

FCC backs SPCC vs. AT&T, states

The FCC this month supported Southern Pacific Communications Company's argument that intrastate circuits, when supplied as part of an interstate service, are subject to federal not state regulation. The decision grows out of a fight between SPCC and the California and Oklahoma public utilities commissions over foreign-exchange circuits (DATA CHANNELS, Aug. '75, page 6). It impacts datacom users because the carriers have been trying, with some success, to impose a surcharge on basically the same type of circuit when it's connected to a data terminal and/or computer port. Such facilities are usually referred to as ISALs ("information system access lines"). If the FCC ruling sticks, ISAL charges probably will be declared illegal since they're imposed under intrastate rather than interstate tariffs. However, last month's FCC ruling seems likely to wind up in court; NARUC, as well as the two state commissions, strongly oppose it. ☐

- AT&T unveiled a new credit authorization terminal last month. Dubbed "Transaction II," it features an 8-character LED display and hands-free operation. Transaction II will be available through Bell operating companies next April, at an estimated price of \$30-35/month, said a company spokesman. Transaction I, introduced several months ago, leases for \$20-25/month. It doesn't have the above features and can converse in only a limited way with a computer that lacks an audio response unit.

Transaction II receives FSK-type data at a user-selected rate of 75, 100, or 150 bps. The 8-position LED display can output all of the numerics plus "about 10" alpha characters, reported the spokesman. He added that the new terminal is also designed for a broader range of applications than its predecessor. Inventory control, and hospital systems where remote access is needed to centralized patient files, were specifically mentioned.

Further improvement of the Transaction terminal series is now being "studied," the spokesman said; one possibility is a larger visual display.

- AT&T hasn't adequately justified its Hi-Lo tariff, the FCC ruled last month. The Commission ordered the company to submit a long list of additional information to support the offering, which has been under investigation since it became effective in June '74 (DATA CHANNELS, May '74, page 7; June '74, page 2). One unresolved question is whether Hi-Lo rates are really based on competitive necessity, as AT&T claims. (The company's market projections contain "unsupported assumptions" and the actual operating results, since Hi-Lo began in 1974, indicate that Bell has "vastly overstated" the private line business it would lose to the specialized carriers, the Commission said). Other unresolved questions: whether Hi-Lo rates reflect the true costs of the facilities actually being used to provide the service; whether the tariff discriminates unfairly against one or more classes of Hi-Lo users (e.g. those in rural areas as compared to those in big cities). Last month's FCC order also said that the revised short-haul rates which recently became effective (DATA CHANNELS, August '75, page 5) may be unreasonable, and made them a subject of the current investigation.

- A knowledgeable source believes the FCC's upcoming decision on certification/interconnection of "foreign attachments" will reduce present barriers substantially. But it's going to take some time, he adds, even though the Commission is supposed to announce its ruling later this month.

Specifically, our source says the Commission will endorse the idea of connecting independently-made data terminals and other "ancillary devices" (but not PBXs) to the dial-up network through a protective coupler like the one offered by Rochester Telephone Company (DATA CHANNELS, Sept. '75, page 1); this device is much simpler than AT&T's data access arrangement (DAA), and less costly to users. The coupler will have to be tested and certified before it can be installed, he adds. The administrative procedure will be essentially the one proposed several months ago by the FCC's chief engineer. The technical specs will be developed by the Commission's PBX advisory committee.

Based on past history, adds our source, the Commission will issue a tentative, not a final decision this month. Then it will allow time for comment by interested parties. More time will have to be allowed after that for the PBX advisory committee to develop the specs. And AT&T is virtually certain to take the decision to court, which may delay the benefits even longer.

- First shipments of Teletype's new Dataspeed 40 CRT terminal, capable of operating synchronously at speeds of 2400 or 4800 bps., reportedly are scheduled for the fourth quarter of this year. Initially, the units will go to Bell operating companies, after which orders from end users will be filled. Until now, Teletype has offered only asynchronous Dataspeed 40s at 2400 and 4800 bps. The new model utilizes BSC communications protocol, as developed by IBM and standardized by ANSI. We were told that there are no plans to modify it to operate on bit-oriented line disciplines like IBM's SDLC until such a protocol has been officially approved as a U. S. standard.

Tariffs covering the new terminal may be filed by one or more Bell operating companies next month.

CCITT tentatively OKs packet protocol standard

A lively debate over packet network protocols for synchronous terminals highlighted last month's Eurocomp data communications conference in London. In one corner was Telenet's president, Larry Roberts, the conference keynoter. His chief adversary was Louis Pouzin, director of the Cyclades Network, an ARPA-like system which began operating several months ago in France.

At the heart of the debate was the question of who should specify the end-to-end communication control codes used on packet networks. Roberts wants his company and other packet network operators to specify them.

Under this scheme, a packet network customer sending a message would generate the end-to-end control codes initially on his own host system, but the bits would be translated into a "virtual call" protocol when they entered the network. At the exit interface, they would be retranslated back into a form compatible with the user's system.

Such a scheme enables existing on-line terminals and computers to utilize packet service even though they are unable to send or receive packets and can't generate the bit-oriented link protocols required. Thus, the network operator can solicit business from a large number of prospective customers immediately.

Pouzin accepts the need for packet network operators to translate their customers' character-oriented link protocols, but he objects when the carriers say they also have to translate the higher-level codes that control routing and processing of packet messages within the host system at the receiving end of the message path. He insists that these latter bits can be generated at the sending end, and then can be carried without change to the receiving end in the same way that the text part of the message is moved.

One benefit of transmitting such messages, which are generally referred to as "datagrams," is that the user's investment is less, since he doesn't have to pay for translation software, explains Pouzin. He adds that transmission is more reliable because the process is simpler and so less can go wrong.

The Key Question

When interviewed at Eurocomp, Pouzin and Roberts agreed that both virtual call and datagram services should be available to packet network users — so, at least on the surface, the disagreement isn't as great as suggested above. However, the

(continued on next page)

key question is whether a standardized packet network protocol can be developed that will satisfy both camps.

Shortly before Eurocomp, a CCITT subcommittee, meeting in Geneva, Switzerland, agreed on key elements of such a protocol. They adopted a "subscriber link access protocol" (SLAP) to control the transport of packets across the network interface — i.e. between the user's site and the related network node. And they defined a virtual call protocol that would include end-to-end control codes. They also talked about an alternate datagram protocol, but left this matter for future action. Thus, for the moment, Pouzin and his allies appear to be losing the battle.

The proposed CCITT protocol is now being reduced to writing and will be proposed to the subcommittee's parent body — CCITT Study Group VII — next Spring. It could be altered at that point, but Roberts doubts this. He says the countries that now have packet networks in operation or under construction — i.e. the ones with the greatest interest in the standard — are the ones who will endorse it.

The proposed protocol can't be adopted finally until October '76, when the group holds its next plenary meeting. But once it's approved by Study Group VII, Roberts expects telecom carriers in France, U.K., Japan, and Canada to begin implementing it. Telenet, he adds "may not even wait until then."

Probably, a CCITT-standardized virtual call protocol will be implemented by systems manufacturers. This would enable the host systems at either end to generate carrier-approved codes to control higher-level functions — which might eliminate the need for translation at the network boundaries and reduce the user's software expense. The result could be a simpler, more reliable system that answered many of the objections raised by Pouzin and his allies.

IBM Is Opposed

One major obstacle to such an accommodation is IBM, which has developed a proprietary communications protocol (SNA/SDLC) and apparently doesn't want to modify it to accommodate the carriers. For several months, officials of the Trans-Canada Telephone System (TCTS) have been discussing such changes with IBM (see DATA CHANNELS, Nov. '74, page 2; Feb. '75, page 4). The goal is to make SNA/SDLC compatible with SNAP, the protocol developed by TCTS to control communications on its new Datapac network. According to earlier reports, Armonk felt that the cost of modifying SNA/SDLC was too high. This month, a knowledgeable source indicated that IBM's position is likely to change once the proposed CCITT protocol is adopted.

Non-IBM system suppliers seem to be much more flexible. As one of them put it in London, "we need the carriers more than they need us, so there will be no hesitation on our part to support whatever protocol they decide on."

Thus, it seems fairly clear that within the next year or so, CCITT probably will adopt a standard virtual call protocol encompassing some higher-level, end-to-end control functions, and that some equipment suppliers will offer host systems specifically designed to operate with the new standard. Until this new software is delivered and fully debugged, though, users will have to employ a virtual call service which is less efficient and more costly — at least according to Pouzin.

Viewdata

Besides the debate over packet protocols, Eurocomp featured a discussion and demonstration of "Viewdata," a proposed on-line information service designed for the general public by the British Post Office. A pilot test of Viewdata is planned next January, a "full market trial" in September '77, and — if all goes well — a full-blown commercial service sometime in 1978.

The Viewdata system includes a standard telephone handset, a connected keypad, a central data base, a standard TV set (color or black and white), and an adaptor unit linked to the

TV through either the aerial socket or a front panel connection. BPO hopes to persuade British TV manufacturers to add the latter to their future models.

The user, by depressing specified numbers on the key pad, accesses desired data base information, which comes back to a buffer in the adaptor unit. From here, it goes through a character-generator that produces a TV display readout. Queries travel to the central site at 75 baud, and information is returned at 1200 baud, using a full-duplex dial-up circuit. The adaptor can buffer about 600 characters — one page of TV display.

BPO officials said that some 40 different kinds of information might be stored in the Viewdata database — ranging from retail store ads to descriptions of courses available at local night schools and menus offered by local restaurants. Specific offerings will be determined during the forthcoming trials. Concurrently, user charges will be fixed. Under one possible option, the user would pay an annual subscription fee and be able to access the system for the price of a local telephone call (the data base would be distributed, so that most queries could be answered from a site within the caller's local exchange area).

BPO officials stressed that anyone intelligent enough to use a telephone can operate a Viewdata terminal and understand what is output on the TV screen. The system's low cost was also stressed, although no specific figures were mentioned.

In this country, Mitre — among others — has tested similar systems using CATV transmission. But the BPO project may involve a far larger universe of users than any previous experiments, and this might bring costs and prices down to a realistic level. A conference paper on Viewdata said "a national network of this type probably could be designed for... a one-million to two-million user population. Clearly, it is also possible to design... for a considerably larger user population."

Reportedly, BPO is at least thinking about offering closed user-group services, via Viewdata, to UK businessmen. One example: a list of product inventories at a particular company's warehouses, which would be accessible to its sales force through the Viewdata telephone/TV terminal. ☐

data channels

A Datamation® Newsletter

Editor: Phil Hirsch

Circulation Director: Sue Ryan

Publisher: James M. Morris

DATA CHANNELS is published monthly by Technical Publishing Company, 1301 South Grove Avenue, Barrington, Ill. 60010. Copyright 1975, Technical Publishing Company. Address subscription inquiries to DATA CHANNELS, 35 Mason Street, Greenwich, Conn. 06830. Phone: (203) 661-5400. Editorial offices: 9805 Singleton Drive, Bethesda, Md. 20034. Phone (301) 530-7271.

SUBSCRIPTION RATES:

1 year (12 issues): \$84.00

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